

IN THE TITLE

Please amend title to read:

JOINT OPTIMIZER OF EXCITATION AND MODEL IN MULTIPULSE SPEECH
CODERS.

IN THE SPECIFICATION

Please amend specification paragraphs 4-9, page 3 to read:

One improvement upon above-mentioned solution is described in U.S. patent number 6,859,775 to Lashkari et al. This improvement describes an improved gradient search algorithm that may be used with iterative root searching algorithms. Briefly stated, the improved gradient search algorithm recalculates the gradient vector at each iteration of the optimization algorithm to take into account the variations of the decomposition coefficients with respect to the roots. Thus, the improved gradient search algorithm provides a better set of roots compared to algorithms that assume the decomposition coefficients are constant during successive iterations.

Please amend specification paragraphs 9-13, page 8 to read:

Conventionally, the coefficients $a_1 \dots a_M$ of this polynomial are computed using a technique known in the art as linear predictive coding ("LPC"). LPC-based techniques compute the polynomial coefficients $a_1 \dots a_M$ by minimizing the total prediction error E_p . Accordingly, the sample prediction error $e_p(n)$ is defined by the formula:

Please amend specification paragraphs 5-16, page 15 to read:

The synthesis error gradient vector $\nabla_j E_s$ is now calculated by substituting formula (27) into formula (25) and formula (25) into formula (24). The updated root vector $\Lambda^{(j+1)}$ at the next

iteration can then be calculated by substituting the result of formula (24) into formula (23). After the root vector $\Lambda^{(i)}$ is recalculated, the decomposition coefficients b_i are updated prior to the next iteration using formula (17). A detailed description of one algorithm for updating the decomposition coefficients is described in U.S. patent number 6,859,775 to Lashkari et al. (Attorney Docket No. 10745/20). The iterations of the gradient search algorithm are repeated until either the step-size becomes smaller than a predefined value μ_{\min} , a predetermined number of iterations are completed, or the roots are resolved within a predetermined distance from the unit circle.